
1 Testing Equipment

Laboratory

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1 CHAPTER ONE:

TESTING EQUIPMENT

The following equipment and supplies are deemed necessary to properly perform the various required tests for aggregate inspection. The technician will have on hand, or have access to sufficient quantities of these supplies or equipment before attempting to conduct tests.

LABORATORY

General

Equipment required for various general procedures:

- 1) Electronic balance, Class G2, general purpose balance in accordance with AASHTO M 231. The balance shall be readable to 0.1 g and accurate to 0.2 g or 0.1% of the test load, whichever is greater, throughout the range of use.
- 2) Laboratory oven capable of maintaining a temperature of 230 ± 9 °F., (gas burners or electric hot plates may be used).
- 3) Metal pans for drying and storage
- 4) Utensils for washing and drying samples, such as trowels, spatulas, etc.
- 5) Appropriate data sheets, log books, etc.

Sampling

Equipment required for **AASHTO T 2** or **ITM 207**:

- 1) Square-nose shovel
- 2) Sample tube for sand
- 3) Containers, such as 20 gallon buckets, plastic fiber bag, etc. Galvanized bushel tubs work well.
- 4) Labels of sufficient size to allow for proper identification of samples.

- 5) Templates for belt sampling.

Sample Reduction

Equipment required for **AASHTO T 248**:

- 1) Mechanical splitters
- 2) Buckets

Sieve Analysis

Equipment required for **AASHTO T 27**

- 1) Sieves - for coarse aggregates 15 in. x 23 in. or 14 in. x 14 in. screens are recommended with sieve designations 2 in., 1 1/2 in., 1 in., 3/4 in., 1/2 in., 3/8 in., No. 4, and pan. For fine aggregates 8 in. round sieves are standard with sieve designations 3/8 in., No. 4, No. 8, No. 16, No. 30, No. 50, No. 100, No. 200, and pan.
- 2) Mechanical sieve shaker -- appropriate model to accommodate sieves.
- 3) Sieve brushes -- Wire and bristle brushes (a wire brush will damage a No. 50 or smaller sieve).

Decantation

Equipment required for **AASHTO T 11**:

- 1) Sieves - No. 16 and No. 200. The No. 200 sieve can be protected from punctures and tears by covering with a No. 16 sieve.
- 2) Container - size sufficient to contain the sample covered with water and permit vigorous agitation.
- 3) Wetting Agent - such as liquid detergent, etc. Some fine materials, especially limestone dust, require a wetting agent to break the surface tension of the particles. A drop or 2 of dish washing liquid is usually sufficient.
- 4) Decant Machine - may be used provided the results are consistent with those obtained using manual operations.

Deleterious and Chert

- 1) Scratch hardness tester.
- 2) Hydrochloric acid and glass plate.

TEST EQUIPMENT VERIFICATION

The test equipment shall be properly verified, and maintained within the limits described in the applicable test method. The Certified Aggregate Producer Program requires equipment to be verified prior to beginning testing in the Coordinated Testing Phase and also at a minimum frequency as follows:

EQUIPMENT	REQUIREMENT	MINIMUM FREQUENCY	PROCEDURES
Balances	Verification	12 mo.	ITM 910
Mechanical shakers	Check sieving thoroughness	12 mo.	ITM 906
Ovens	Verify temperature settings	6 mo.	ITM 903
Sieves	Check physical thoroughness	6 mo.	ITM 902

LABORATORY SET-UP

Proper organization of the laboratory is necessary in order to maximize efficiency and minimize problems and erroneous results. Special consideration should be given to the “flow” of the work to be done and the laboratory organized in the direction of this flow. For example, one might arrange the equipment from left to right when running sieve analyses as follows:

- 1) Riffle splitter -- for reduction of incoming samples.
- 2) Oven -- for drying samples after reduction.
- 3) Cooling rack and fan -- for cooling samples when dry (note: make sure that the fan does not blow towards the balance in the weighing area and does not disperse sample fines)..

- 4) Coarse aggregate shaker.
- 5) Fine aggregate shaker.
- 6) Weighing area -- balance should be in an area free from vibration, dust, and air flow.

Every laboratory situation is different. The lab should be set up to meet the flow requirements of the most routine test performed. The need for back-tracking should be minimized, especially if more than one technician is working at a time. A little extra time and thought to the set up of the lab will significantly increase productivity and decrease turn-around time.